Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

1. (currently amended) A method of fault detection in ~~manufacturing equipment~~ a semiconductor substrate chamber processing tool having at least one sensor providing a plurality of data sensitive to tool-state and process-state changes, ~~with at least one output indicative of the present state of the equipment~~, the method comprising the steps of:

(a) establishing a set of vectors representing the magnitude and direction of the deviation of sensor data from nominal values for ~~sensor data that are representative of~~ a state of the ~~equipment~~ tool under a fault condition, said fault condition generating a recordable fault fingerprint,

(b) performing step (a) a plurality of times for a plurality of different fault conditions respectively and storing the ~~data~~ resultant sets of vectors in a fault fingerprint library, the fault fingerprints being substantially invariant across different tools built to the same nominal specification and running the same nominal process,

(c) determining a set of vectors representing the deviation of sensor data from nominal values for the present state of ~~equipment using at least one sensor~~ the tool, and

(d) detecting a fault based on a comparison of the present state ~~sensor data~~ set of vectors with at least one fault fingerprint in the fault fingerprint library.

2.(cancelled) The method claimed in claim 1, wherein the fault fingerprints is substantially invariant across different manufacturing equipment built to the same nominal specification and running the same nominal process.

3. (cancelled) The method claimed in claim 2, wherein in step (d) the comparison is made between a set of vectors representing the deviation of sensor data from nominal values for the fault fingerprint and the corresponding set of vectors representing the deviation of sensor data from nominal values for the present state.

4. (currently amended) The method claimed in ~~claim 3~~ claim 1, wherein the nominal values used for calculating the set of vectors for the present state are nominal values of the sensor data from the sensor of the said ~~manufacturing equipment~~ tool.

5. (currently amended) The method claimed in ~~claim 3~~ claim 1, wherein the nominal values used for calculating the set of vectors for the present state are nominal values of the sensor data from the sensor of different manufacturing equipment built to the same nominal specification and running the same nominal process as the first mentioned manufacturing equipment.

6. (currently amended) The method claimed in ~~claim 3~~ claim 1, wherein the comparison is made by correlation between the sets of fault fingerprint and present state vectors.

7. (currently amended) The method claimed in ~~claim 3~~ claim 1, wherein the comparison is made by calculating a Euclidean distance between the sets of fault fingerprint and present state vectors.

8.(original) The method claimed in claim 1, further comprising the step of predicting the impact of the fault on a particular process output.

9. (currently amended) The method claimed in claim 1, further comprising the step of controlling at least one ~~equipment~~ tool input to compensate for the fault.

10. (currently amended) The method claimed in claim 1, wherein the fault fingerprint is derived from a tool profile comprising a set of ~~equipment~~ tool input versus sensor response curves.

11. (currently amended) The method claimed in claim 1, wherein the ~~manufacturing equipment~~ tool comprises a plasma chamber.

12. (original) A computer readable medium containing program instruction which, when executed by a data processing device, perform the method steps claimed in claim 1.